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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/774,559
Filing Date: February 09, 2004
Appellant(s): BIDDULPH ET AL.

Scott A. McCollister
Reg. No. 33,961
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8 November 2010 appealing from the Office action mailed 6 July 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application: Claims 1-6, 8-9 and 19-23.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

WO 02/07902	Duprat et al.	01-2002
US 6,719,852	Oshima et al.	04-2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-6, 8-9 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 02/07902(WO'902).

WO'902 teaches a two stage anticorrosive black coating forming process wherein the first stage comprises the application of an anticorrosive aqueous acidic coating solution free of hexavalent chromium, wherein the coating solution comprises 0.02mol/l – 0.58mol/l of Cr(III), 0.1mol/l – 0.42mol/l of phosphate ions incorporated from phosphoric acid or sodium phosphate, 0.001mol/l – 0.1mol/l of iron, cobalt and/or nickel ions. WO'902 also teaches that the coating solution comprises one or more citric acid, tartaric acid, malonic acid as complexing agents to complex the Cr(III) ions and to regulate the chrome(III) hydroxide precipitate on the metal surface. The pH of the coating solution is maintained between 1 and 4 by using nitric or sulfuric acids. WO'902 further teaches that the phosphate is favorably added for the formation of a dark

conversion coating and iron, cobalt and/or nickel are added for the formation of a black color coating(official translation: page 5, 2nd paragraph – page 8, 3rd paragraph).

Regarding claims 1-6, 8-9, 19-20 and 22-23, the one or more citric acid, tartaric acid and malonic acid as taught by WO'902 read on the claimed chelate. The nitrate and sulfate ions from the nitric or sulfuric acid used for pH control as taught by WO'902 read on the claimed sulfate and/or nitrate ions. The iron, cobalt and nickel ions as taught by WO'902 read on the claimed transition metal or metalloid.

In addition, the component concentrations of Cr(III) ions, phosphorous anions, Fe/Co/Ni ions, the pH value ranges and the Cr(III) to Fe/Co/Ni ratio range(i.e. as calculated from the concentrations of Cr(III) ions and Fe/Co/Ni ions) in the first coating solution of WO'902 overlap the claimed component concentration ranges, the claimed pH value range and the claimed Cr(III) to transitional metal or metalloid range. Therefore, a prima facie case of obviousness exists. See MPEP 2144.05. The selection of claimed component concentrations and pH range from the disclosed ranges of WO'902 would have been obvious to one skilled in the art since WO'902 teaches the same utilities in its disclosed component concentration ranges, pH value range, and Cr(III) to Fe/Co/Ni ratio range.

With respect to the claimed amounts of organic chelate, the carboxylic acids as taught by WP'902 such as citric acid, tartaric acid, malonic acid are used to complex the Cr(III) ions and to regulate the chrome(III) hydroxide precipitate on the metal surface (official translation: page 7, 1st paragraph). Therefore, WO'902 teaches that the carboxylic aids such as citric, tartaric and malonic acids are result effective variables.

One of ordinary skill in the art would have found it obvious to have varied the concentration of the carboxylic acids in the coating solution of WO'902 via routine optimization in order to perform the desired complexing of Cr(III) and to achieve desired amount Cr(III) hydroxide precipitation.

With respect to the claimed amount of sulfate and nitrate ions, WP'902 teaches that sulfuric and nitric acids are used to control pH of the coating solution(official translation: page 5, 3rd paragraph). Therefore, the concentrations of sulfate and nitrate ions are result effective variables. One of ordinary skill in the art would have find it obvious to have varied the amount of sulfate and nitrate ions in the coating solution of WO'902 via routine optimization in order to achieve and maintain desired pH level in the coating solution.

Furthermore, since the trivalent chromium containing anticorrosive coating solution used in the first stage of the process of WO'902 is significantly similar the claimed aqueous acidic solution and WO'902 further teaches that the presence of phosphate, iron, cobalt and/or nickel benefit the formation of a black coating(official translation: page 7, 2nd paragraph; page 8, 3rd paragraph), one of ordinary skill in the art would have expected that the hexavalent chromium free trivalent chromium containing anticorrosive coating solution used in the first stage of the process of WO'902 is capable of providing a black chromate conversion coating layer in a single layer as claimed.

Regarding claim 21, WO'902 teaches that phosphate ions can be used to form a dark conversion coating(official translation: page 7, 2nd paragraph). Although WO'902 does teach several phosphate anion containing compounds suitable for such a purpose,

the scope of WO'902's teaching includes just one of such phosphate anion containing compounds. Therefore, the examiner concludes that teachings of WO'902 meet the claimed limitation of "wherein the phosphorous anions consisting of phosphate anions".

Claims 1-6, 8-9 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima et al. US 6,719,852 B2(Oshima) in view of WO 02/07902 (WO'902).

Oshima teaches an aqueous acidic coating solution that is free of hexavalent chromium(abstract), wherein the coating solution comprises 0.2-5g/l of trivalent chromium ions(col. 4 lines 14-21), 0.2-10g/l of cobalt ions(col. 4 lines 33-45), 1-50g/l of inorganic salts of nitric or sulfuric acid(col. 4 lines 54-60), 0.1-50g/l of phosphoric acid (col. 4 lines 61-67) and 1-30g/l of carboxylic acids, such as citric acid, tartartic acid, malonic acid and succinic acid (col. 5 lines 1-7) and 0.2-13g/l of oxalic acid(col. 4 lines 27-32). The coating solution of Oshima has a pH of 0.5-4(col. 5 lines 8-10).

Regarding claims 1-6, 8-9, 19-20 and 22-23, the oxalic acid or any of the carboxylic acids listed above as taught by Oshima read on the claimed chelate. The nitrate and sulfate ions from the inorganic salts of nitric or sulfuric acid as taught by Oshima read on the claimed sulfate and/or nitrate ions. The cobalt ions as taught by Oshima read on the claimed transition metal or metalloid.

However, even though Oshima teaches various color finishes in its examples (Table 4). Oshima does not explicitly teach that the coating solution can produce a black chromate coating as claimed.

The teachings of WO'902 are discussed above. WO'902 further teaches that cobalt, iron and/or nickel in the amounts of 0.001 mol/l and 0.1 mol/l each can be added to promote a black color film(official translation: page 8, 3rd paragraph). Presence of phosphate also helps formation of a dark conversion coating(official translation: page 7, 2nd paragraph).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated cobalt, nickel and/iron in a concentration of 0.001-0.1mol/l each as taught by WO'902 into the coating solution of Oshima in order to produce a black chromate coating. In addition, WO'902 teaches a coating solution that has significantly the same coating components as the coating solution of Oshima. The teachings of Oshima and WO'902 further show that different coating component concentrations result in different coating colors. Therefore, one of ordinary skill in the art would have found it obvious to have varied the concentrations of the coating components in the coating solution of Oshima in order to achieve a desired coating color such as the black color coating as claimed.

In addition, the component concentrations of Cr(III) ions, phosphorous anions, Co ions, oxalic acid and/or carboxylic acids, Cr(III) ion/Co ion ratio and the pH value in the coating solution of Oshima in view of WO'902 overlap the claimed component concentration ranges and the claimed pH value range. Therefore, a prima facie case of obviousness exists. See MPEP 2144.05. The selection of claimed component concentrations, Cr(III)/transitional metal or metalloid ion ratio and pH ranges from the disclosed ranges of Oshima in view of WO'902 would have been obvious to one skilled

in the art since Oshima in view of WO'902 teach the same utilities in their disclosed component concentration, Cr(III)/Co ion ratio and pH value ranges.

Furthermore, since the acidic coating solution of Oshima in view of WO'902 is significantly similar the claimed aqueous acidic solution and comprises phosphate, iron, cobalt and/or nickel ions that are recommended for forming a black coating as taught by WO'902, one of ordinary skill in the art would have expected that the acidic trivalent chromium containing solution of Oshima in view of WO'902 is capable of providing a black chromate conversion coating layer in a single layer as claimed.

Regarding claim 21, although Oshima teaches at least one phosphate anion containing compounds(col. 4 lines 61-67), the scope of Oshima's teaching includes just one of such phosphate anion containing compounds. Therefore, the examiner concludes that teachings of Oshima meet the claimed limitation of "wherein the phosphorous anions consisting of phosphate anions".

(10) Response to Argument

Appellant argues that WO'902 teaches a two-step process that produces a two-layer black anticorrosive coating instead of a single layer black chromium conversion coating as claimed.

The examiner does not find appellant's argument persuasive because what is claimed is an aqueous acidic solution that is capable of producing a single layer black chromium coating. Appellant's emphasis on WO'902's two-step coating process only points out the differences between the coating process of WO'902 and the coating process of the instant invention. However, the scope of the claim is directed to a

coating solution rather than a coating process. Although the process of WO'902 contains two process steps, it does not mean that the Cr(III) containing coating solution used in the first coating step of WO'902 is incapable of producing a black conversion coating layer. As a matter of fact, WO'902 clearly teaches that its coating components such as phosphate, Fe, Co and Ni contribute to the formation of a black coating. Therefore, one of ordinary skill in the art would have expected that the trivalent chromium coating solution used in the first stage of WO'902's process is capable of producing a black chromate coating layer as claimed.

Appellant further argues that a black pigment is added to the second coating layer of WO'902 which is important in maintaining the anti-corrosion quality and the color quality of the first layer.

The examiner does not find applicant's argument convincing because the black pigment used in the second process step of WO'902 considered an optional component (official translation: page 5, 1st and 2nd paragraphs), which means that the coating process of WO'902 is capable of forming a black coating layer without the additional of the black pigment. The use of a black pigment in the second step of WO'902 is not a negative teaching against the formation of a black coating layer by the first coating solution of WO'902 that is substantially similar to the claimed coating solution. The degree of blackness produced by the first coating solution of WO'902 might not have been as intense without the optional black pigment in the second coating. However, the first coating solution of WO'902 still meets the limitations of the instantly claimed coating solution since it is capable of producing a black coating due to the presence of

phosphate, Fe, Co and Ni ions, all of which are known to enhance the formation of a black coating according to WO'902. Additionally, appellant has not provided factual evidence data demonstrating the Cr(III) containing first coating solution as taught by WO'902 is not capable of producing a black coating on its own.

Appellant further argues that there is no motivation to adjust sulfate and/or nitrate ion concentration in WO'902 since the pH WO'902 already overlaps the claimed pH range.

The examiner does not find appellant's argument persuasive because pH of the coating bath affects coating process and the coating quality. Therefore, controlling the pH of the coating solution by adding sulfuric and/or nitric acids as taught by WO'902 is mechanism used to control coating quality and coating properties. In addition, WO'902 prefers using nitric acid or sulfuric acid for pH adjustment and control(official translation: page 5, 3rd paragraph). One of ordinary skill in the art would have find it obvious to have varied the amount of sulfate and nitrate ions in the coating solution of WO'902 via routine optimization in order to achieve and maintain desired pH in the coating solution.

Appellant further argues that both Oshima and WO'902 teach adding color pigment or dye in a topcoat. Therefore, combining Oshima and WO'902 would only result in a two layer coating system with the black pigment in the topcoat.

The examiner does not find appellant's argument persuasive because WO'902 teaches adding various black color contributing components such as phosphate, Fe, Co and Ni to a trivalent chromium solution to promote the formation of a black coating. Therefore, one of ordinary skill in the art would have found it obvious to have

incorporated some or all of phosphate, Fe, Co and Ni ions, all of which are added to the Cr(III) coating solution used in the first coating step of WO'902, into the Cr(III) conversion coating solution of Oshima in order to achieve a black coating with expected success.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Lois L. Zheng/

Conferees:

/ Roy King/

Supervisory Patent Examiner, Art Unit 1733

/Christine Tierney/

Supervisory Patent Examiner, Art Unit 1700